NAILER WITH IMPROVED SPACER ACTUATOR

RELATED U.S. APPLICATIONS

Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable.

REFERENCE TO MICROFICHE APPENDIX

Not applicable.

FIELD OF THE INVENTION

[0001] The present invention relates generally to a nailer, and more particularly to a nailer with an improved spacer actuator design.

BACKGROUND OF THE INVENTION

[0002] The conventional nailer is generally designed with a spacer structure whereby a container tube is placed nearby the nailer body to accommodate the spacer. And, a flexible propelling block is placed at the top of container tube to push down the spacer flexibly. However, the following disadvantages shall be addressed during applications:

[0003] As the flexible propelling block is available with a rod-like shape, the top end of the propelling block will protrude from the top of the container tube in the presence of many spacers within the container tube. Therefore, the distortion of the top end is possible due to the collision when

the nailers are operated by the workers or placed on site. In such case, the operational work will be adversely affected or disrupted for unexpected maintenance or replacement.

[0004] Based upon the aforementioned disadvantages of the spacer structure of conventional nailer, this industry shall assume the responsibility to make pioneering R& D and innovation for an ideal utility model.

BRIEF SUMMARY OF THE INVENTION

[0005] The present invention has offered an improved efficiency as detailed below:

[0006] 1. To provide a flexible propelling unit 20 that is placed into a liftable cover 30. The propelling block is designed with an innovative structure whereby the fixation or operation is subjected to the control of an adjustable control board 23. This is a preferred option of this industry in conformity with the requirements of a new patent.

[0007] 2. Based upon this modified structure of nailer with improved spacer actuator design, it's possible to reduce the space considerably and avoid distortion arising from the impact of external force.

[0008] The new advantages of the present invention include:

[0009] 1. The fixation or operation of the propelling block 21 as well as the compression or extending state of the spring can be achieved through the control board 23 in an effective manner.

[0010] 2. Based upon the structural design that an inclined plane 15 is provided at the top end of the container tube 10, it can be seen that, the cover 30, which is opened with a preset angle, will be fixed when one side abuts upon the inclined plane 15.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0011] FIG. 1 shows a perspective view of the present invention.

[0012] FIG. 2 shows an exploded view of the present invention.

[0013] FIG. 3 shows a cross-sectional view 1 of a propelling block fixed in the cover.

[0014] FIG. 4 shows a section plan of control board in an adjustable state.

[0015] FIG. 5 shows a cross-sectional view 1 for a propelling block moving downwards.

[0016] FIG. 6 shows a schematic plan of a compressed rod hook.

[0017] FIG. 7 shows a schematic plan of an opened cover.

[0018] FIG. 8 shows a perspective view of another Example.

[0019] FIG. 9 shows a cross-sectional view of FIG. 8.

DETAILED DESCRIPTION OF THE INVENTION

[0020] The features and the advantages of the present invention will be more readily understood upon a thoughtful deliberation of the following detailed description of a preferred embodiment of the present invention with reference to the accompanying drawings.

[0021] As shown in FIGS. 1-3, a nailer embodied in the present invention comprises: a nailer body A and a spacer actuator design B, of which the spacer actuator design B generally comprises a container tube 10 and a flexible propelling unit 20. The hollow tube 11 of the container tube 10 is used to superpose the spacers 12 of the nailer. And, the bottom of the container tube 10 shall be fastened securely to a preset pedestal board 05 at the bottom of the nailer A, where the spacer 12 at the base of container tube 10 will move towards the outlet of the nailer A. The features include:

[0022] A liftable cover 30, which allows a shaft axle to screw one side into the top of the container tube 10. In the case of a closing state of the cover 30, the hollow trough 31 will align itself with the open hollow tube 11 of the container tube 10. An enclosed surface 32 is arranged at the top of the hollow trough 31 while an L-shape guide trough 33 is mounted at one side wall of the hollow trough 31. Moreover, a wedge groove 34 is placed at the end of L-shape guide trough 33, where a vertical guide trough 13 is provided at one side wall of the container tube's 10 hollow tube 11. In the case of a closing state of the cover 30, the top end of the vertical guide trough 13 will be connected to L-shape guide trough 33. Still, a fixation component 40 is provided at the other side of the cover 30 to ensure the fixation of the closed cover 30;

[0023] A propelling unit 20, which comprises a propelling block 21, a spring 22 and a control board 23. The propelling block 21 is placed at the bottom of the hollow trough 31 of the cover 30, the control board 23 is provided at the inner side of the propelling block 21 and the spring 22 is mounted between the control board 23 and the inner wall of hollow trough 31 to push down the propelling block 21 flexibly. The outer face of the control board 23 is provided with a toggle switch 24 that protrudes from L-shape guide trough 33. When the toggle switch 24 is inserted into the wedge groove 34 of L-shape guide trough 33, the propelling block 21 will be fixed to avert spring 22 into a compressing state; When the toggle switch 24 shifts out of the wedge groove 34 of L-shape guide trough 33, the propelling block 21 will slide downwards along the hollow tube 11 of the container tube 10 and put the spring 22 into an extending state, thereby pressing and superposing flexibly the spacers 12 within the hollow tube 11.

[0024] The fixation component 40 of the cover 30 is designed with a rotary rod hook 41. The pivot point 42 of the rod hook 41 is provided at the lower part of the middle section while the bottom hook

43 of the rod hook 41 extends to one side of the top end of the container tube 10. A spring reposition component 50 (e.g. helical spring) is provided between the inner side of the top of rod hook 41 and the concave 35 at one side of cover 30, where it can flexibly push out the top end of the rod hook 41, namely the bottom hook 43 of the rod hook 41 can flexibly rotate inwards. The container tube 10 is provided with a wedge position 14 at one side of its top end, which is used to fix the bottom hook 43 of the rod hook 41 when the latter one rotates inwards. The wedge position 14 is designed with a cross pin bolt.

[0025] An everting inclined plane 15 is provided at the top end of the container tube 10 facing the connection surface of the cover 30. Thereupon, when the cover 30 is opened with a preset angle, the container tube 10 can be fixed with one side of the cover 30 abutting upon the above-mentioned inclined plane 15(as shown in FIG. 7).

[0026] The propelling block 21 is made of rubber materials.

[0027] The peripheral bottom of the propelling block 21 is designed with a ring-shaped oblique plane 26.

[0028] As shown in FIGS. 8-9, the pedestal board 05 of the nailer A is provided with a flexible spacing unit between the container tube 10 and outlet of nailer. The spacing unit comprises a fastener post 61, a spring 62 and a container base 63, of which the bottom of the fastener post 61 inserts into the pedestal board 05 while its top is fastened within the container base 63 for the operation of the spring 62 under its upper wall. Thereupon, the bottom of the fastener post 61 is designed with a flexible convex, which can flexibly abut upon the spacer 12 of the pedestal board 05, so as to prevent the spacer from sliding backwards i.e. the direction of container tube.

[0029] Based upon the aforementioned structure of the present invention, the operating process of the nailer's spacer actuator design is as follows:

[0030] As shown in FIG. 3, the cover 30 of the spacer actuator design B is in a closing state. In such case, the cover 30 can be screwed and fixed into the wedge position 14 of the container tube 10 via the hook 43 of a rotary rod hook 41. And, before the spacer 12 is placed into the hollow tube 11 of the container tube 10, the end-user can use the toggle switch 24 to adjust and fix the control board 23 into the wedge groove 34 of the cover's 30 L-shape guide trough 33, thereby the spring 22 will be placed into a compressing state.

[0031] As shown in FIG. 6, when the cover 30 is intended to be opened, you're allowed to press down the top end of the rod hook 41, thus enabling the bottom hook 43 to remove from the wedge position 14 of the container tube 10. Then, the cover 30 can be opened by the pivot point of the connection surface, so the spacer 12 can be placed into the hollow tube 11 of the container tube 10 (as shown in FIG. 7).

[0032] As shown in FIGS. 4-5, when the cover 30 is in a closing state, the end-user is allowed to remove the toggle switch 24 of the control board 23 from the wedge groove 34 of L-shape guide trough 33. In this way, the non-locating propelling block 21 will slide downwards along the hollow tube 11 of the container tube 10. And, the toggle switch 24 of the control board 23 can slide downwards along a vertical guide trough 13 at one side wall of the container tube 10. Meanwhile, it will put the spring 22 into an extending state, and the propelling block 21 will be activated to press flexibly the top of spacer 12 into the hollow tube 11, thus the spacer 12 will move downwards under the pressure.